Reporting Results

From the article "Aspirin for Prevention of Cardiovascular Events in a General Population Screened for a Low Ankle Brachial Index, A Randomized Controlled Trial"

Read these paragraphs and discuss. How well do they meet the criteria we discussed last time?

p.841, abstract objective and conclusion

p.844, results, first paragraph under Effectiveness End Points

How about this paragraph? For this one, also discuss how well they did at meeting the new ASA guidelines.

p.846, discussion, paragraph starting "Although we found no statistically..."

The ASA just this week came out with a major statement on p-values.
http://dx.doi.org/10.1080/00031305.2016.1154108

Here are the the main six points.

1. P-values can indicate how incompatible the data are with a specified statistical model.
2. P-values do not measure the probability that the studied hypothesis is true, or the probability that the data were produced by random chance alone.
3. Scientific conclusions and business or policy decisions should not be based only on whether a p-value passes a specific threshold.
4. Proper inference requires full reporting and transparency.
5. A p-value, or statistical significance, does not measure the size of an effect or the importance of a result.
6. By itself, a p-value does not provide a good measure of evidence regarding a model or hypothesis.

Here's the conclusion: "Good statistical practice, as an essential component of good scientific practice, emphasizes principles of good study design and conduct, a variety of numerical and graphical summaries of data, understanding of the phenomenon under study, interpretation of results in context, complete reporting and proper logical and quantitative understanding of what data summaries mean. No single index should substitute for scientific reasoning."

Here's an excerpt from a related 1929 Fisher article, from the "Proceedings of the Society for Psychical Research"
https://digital.library.adelaide.edu.au/dspace/bitstream/2440/15204/1/79.pdf

"An observation is judged significant, if it would rarely have been produced, in the absence of a real cause of the kind we are seeking. It is a common practice to judge a result significant, if it is of such a magnitude that it would have been produced by chance not more frequently than once in twenty trials. This is an arbitrary, but convenient, level of significance for the practical investigator, but it does not mean that he allows himself to be deceived once in every twenty experiments. The test of significance only tells him what to ignore, namely all experiments in which significant results are not obtained. He should only claim that a phenomenon is experimentally demonstrable when he knows how to design an experiment so that it will rarely fail to give a significant result. Consequently, isolated significant results which he does not know how to reproduce are left in suspense pending further investigation."

Reporting Proportions

A researcher develops a new drug to prevent the common cold in children over the age of two. In his study, 1000 children received placebo and 1000 received the drug. During the six month follow-up period, the researchers diagnosed colds in 650 of the children on placebo and in 500 who received the new drug.

Calculate the odds ratio. Write a sentence using it, using the context of this example.

"The treatment decreases colds by 15%." Is this correct? Would you change the wording?"

"The treatment decreases colds by 23%." Is this correct? Would you change the wording?

Calculate the number needed to treat (NNT). Write a sentence using it.

Relative risk is the most commonly reported form of risk reduction. That is because it usually makes an effect or result sound more impressive. If you are a researcher seeking funding based on the results of your work, or are trying to get media attention for your discovery, or if you are a drug company trying to convince patients or doctors to prescribe your medication, you are motivated to make the results sound as impressive as possible. For example, consider the following three scenarios, each with a different prevalence of the outcome in question, and calculate the odds ratio, the absolute risk reduction, the relative risk reduction, and the number needed to treat.

	Control Rate	Experimental Rate	OR	ARR	RRR	NNT
Scenario A	1%	0.5%				
Scenario B	10%	5%				
Scenario C	50%	25%				

Which number sounds the most impressive for each scenario? Which treatment would you rather be on?

Continuing with the cold study... If they developed symptoms of a cold, they were also examined to look for the presence of an ear infection. Ear infection was diagnosed in 300 of the children with colds on active treatment and in 298 of the children with colds on placebo.

Discuss with your group how you would report these results. Keep in mind that this is from the same study as the first example.

Examples and some wording taken today from Mark Ebell, University of Georgia, `http://ebp.uga.edu/courses/`*, Chapter 8*

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Name: _____

What did you learn today about reporting and interpreting results, especially about p-values and proportions?